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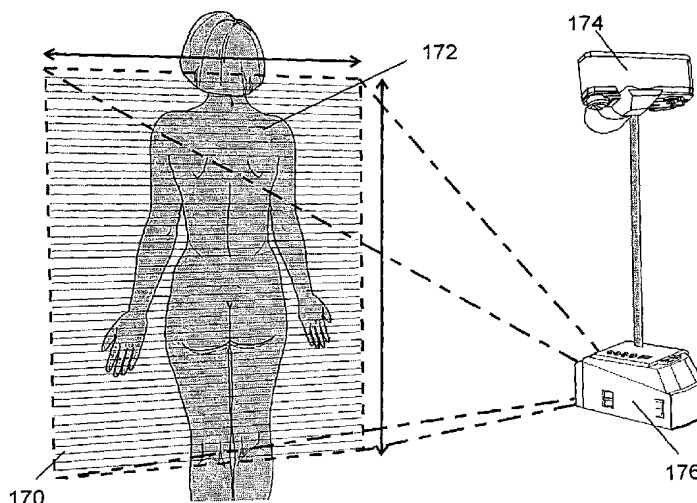
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(54) Title: TIME-DEPENDENT THREE-DIMENSIONAL MUSCULO-SKELETAL MODELING BASED ON DYNAMIC SURFACE MEASUREMENTS



(57) Abstract: Active contour models and active shape models were developed for the detection of the kinematics landmarks on sequential back surface measurements. The anatomical landmarks correspond with the spinous process, the dimples of the posterior superior iliac spines (PSIS), the margo mediales and the elbow. Back surface curvatures are used as a basis to guide the ACM and ASM's towards interesting landmark features on the back surface. Geometrical bending and torsion costs, and the main modes of variation of the landmark points are added to the models in order to avoid unrealistic curve shapes from a biomechanical point of view. Reconstruction of the underlying skeletal structures is performed using the surface normals as approximations for skeletal rotations (e.g. axial vertebrae rotations, pelvic torsion, etc.) and anatomical formulas to estimate skeletal dimensions.

WO 2005/082249 A3



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